

Amendment and Response Under 37 C.F.R. §1.116 - Expedited Examining Procedure

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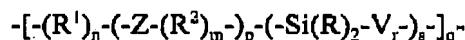
Confirmation No.: 2399

Filed: September 16, 2003

**For: COMPOUNDS CONTAINING QUATERNARY CARBONS AND SILICON-CONTAINING GROUPS,
MEDICAL DEVICES, AND METHODS****Amendments to the Claims**

This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (Currently Amended) A medical device comprising a segmented polymer comprising a soft segment comprising a group of the formula:



wherein:

$n = 0$ or 1 ;

$m = 0$ or 1 ;

$p = 1-100,000$;

$r = 0-100,000$;

$s = 1-100,000$;

$q = 1-100,000$;

R^1 and R^2 are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

V is $[-O-Si(R)_2-]$ or R^1 ;

with the proviso that the polymer is [[substantially]] free of carbonate linkages.

2. (Original) The medical device of claim 1 wherein $p = 1-5000$.

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3. (Original) The medical device of claim 2 wherein p = 2-12.
4. (Original) The medical device of claim 1 wherein R¹ and R² are each independently a straight chain alkylene group, an arylene group, or combinations thereof.
5. (Original) The medical device of claim 4 wherein R¹ and R² are each independently a straight chain alkylene group.
6. (Original) The medical device of claim 1 wherein R¹ and R² are each independently groups containing up to 100 carbon atoms.
7. (Original) The medical device of claim 6 wherein R¹ and R² are each independently groups containing up to 20 carbon atoms.
8. (Original) The medical device of claim 7 wherein R¹ and R² are each independently groups containing 2 to 20 carbon atoms.
9. (Currently Amended) The medical device of claim 1 wherein each R³ is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.
10. (Currently Amended) The medical device of claim 9 wherein each R³ is independently a straight chain alkyl group, optionally including heteroatoms.
11. (Original) The medical device of claim 10 wherein each R³ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.

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12. (Original) The medical device of claim 1 wherein the polymer further comprises a urethane group, a urea group, or combinations thereof.
13. (Original) The medical device of claim 12 wherein the polymer comprises a segmented polyurethane.
14. (Original) The medical device of claim 1 wherein the polymer is a biomaterial.
15. (Currently Amended) The medical device of claim 14 wherein the polymer is [[substantially]] free of ether, ester, and carbonate linkages.
16. (Original) The medical device of claim 1 wherein the polymer is linear, branched, or crosslinked.
17. (Currently Amended) A medical device comprising a segmented polymer comprising a soft segment prepared from a compound of the formula:
$$Y-[-(R^1)_n-(-Z-(R^2)_m-)_p-(-Si(R)_2-V_r-)_s-]_q-R^3-Y$$
wherein:
each Y is independently OH or NR⁴H;
 $n = 0 \text{ or } 1;$
 $m = 0 \text{ or } 1;$
 $p = 1-100,000;$
 $r = 0-100,000;$
 $s = 1-100,000;$
 $q = 1-100,000;$
 $R^1, R^2, \text{ and } R^3 \text{ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;}$

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Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, ~~optionally including heteroatoms~~, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, ~~optionally including heteroatoms~~;

each R^4 is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; and

V is $[-O-Si(R)_2-$ or] R^1 ;

with the proviso that the polymer is $[[$ substantially $]]$ free of carbonate linkages.

18. (Original) The medical device of claim 17 wherein $p = 1-100$.
19. (Original) The medical device of claim 18 wherein $p = 2-12$.
20. (Original) The medical device of claim 17 wherein the number average molecular weight of the compound of the formula $Y-[-(R^1)_n-(-Z-(R^2)_m-)_p-(-Si(R)_2-V_r-)_q-]_q-R^5-Y$ is no greater than about 100,000 grams/mole.
21. (Original) The medical device of claim 20 wherein the number average molecular weight of the compound of the formula $Y-[-(R^1)_n-(-Z-(R^2)_m-)_p-(-Si(R)_2-V_r-)_q-]_q-R^5-Y$ is about 1000 grams/mole to about 1500 grams/mole.
22. (Original) The medical device of claim 17 wherein R^1 and R^2 are each independently a straight chain alkylene group, an arylene group, or combinations thereof.
23. (Original) The medical device of claim 22 wherein R^1 and R^2 are each independently a straight chain alkylene group.

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24. (Original) The medical device of claim 17 wherein R¹ and R² are each independently groups containing up to 100 carbon atoms.
25. (Original) The medical device of claim 24 wherein R¹ and R² are each independently groups containing up to 20 carbon atoms.
26. (Original) The medical device of claim 25 wherein R¹ and R² are each independently groups containing 2 to 20 carbon atoms.
27. (Original) The medical device of claim 17 wherein each R² includes at least two carbon atoms.
28. (Currently Amended) The medical device of claim 17 wherein each R³ is independently a straight chain alkyl group, an aryl group, or combinations thereof, ~~optionally including heteroatoms~~.
29. (Currently Amended) The medical device of claim 28 wherein each R³ is independently a straight chain alkyl group, ~~optionally including heteroatoms~~.
30. (Original) The medical device of claim 29 wherein each R³ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.
31. (Original) The medical device of claim 17 wherein the polymer further comprises a urethane group, a urea group, or combinations thereof.
32. (Original) The medical device of claim 31 wherein the polymer comprises a segmented polyurethane.

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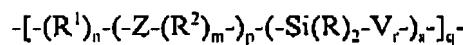
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33. (Original) The medical device of claim 17 wherein the polymer is a biomaterial.
34. (Currently Amended) The medical device of claim 33 wherein the polymer is [[substantially]] free of ether, ester, and carbonate linkages.
35. (Original) The medical device of claim 17 wherein each Y is OH.
36. (Original) The medical device of claim 17 wherein each R⁴ is independently H or a straight chain alkyl group.
37. (Original) The medical device of claim 36 wherein each R⁴ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.
38. (Original) The medical device of claim 36 wherein each R⁴ is H.
39. (Original) The medical device of claim 17 wherein the polymer is linear, branched, or crosslinked.
40. (Currently Amended) A segmented polymer comprising a soft segment comprising a group of the formula:

**wherein:**

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

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MEDICAL DEVICES, AND METHODS** $s = 1-100,000;$ $q = 1-100,000;$

R^1 and R^2 are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

 V is $[-O-Si(R)_2- or] R^1$;with the proviso that the polymer is [[substantially]] free of carbonate linkages.

41. (Original) The polymer of claim 40 wherein $p = 1-5000$.
42. (Original) The polymer of claim 40 wherein $p = 2-12$.
43. (Original) The polymer of claim 40 wherein R^1 and R^2 are each independently a straight chain alkylene group, an arylene group, or combinations thereof.
44. (Original) The polymer of claim 43 wherein R^1 and R^2 are each independently a straight chain alkylene group.
45. (Original) The polymer of claim 40 wherein R^1 and R^2 are each independently groups containing 2 to 20 carbon atoms.
46. (Currently Amended) The polymer of claim 40 wherein each R^3 is independently a straight chain alkyl group, an aryl group, or combinations thereof, optionally including heteroatoms.

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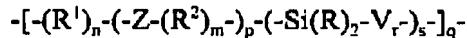
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47. (Currently Amended) The polymer of claim 46 wherein each R³ is independently a straight chain alkyl group, optionally including heteroatoms.

48. (Original) The polymer of claim 47 wherein each R³ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.

49. (Original) The polymer of claim 40 which is linear, branched, or crosslinked.

50. (Currently Amended) A segmented polymer comprising a urethane group, a urea group, or combinations thereof, and a soft segment comprising a group of the formula:



wherein:

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

q = 1-100,000;

R¹ and R² are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;

each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms; and

V is [[-O-Si(R)₂- or]] R¹;

with the proviso that the polymer is [[substantially]] free of carbonate linkages.

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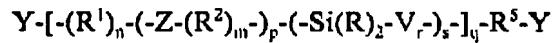
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51. (Original) The polymer of claim 50 wherein p = 1-100.
52. (Original) The polymer of claim 51 wherein p = 2-12.
53. (Original) The polymer of claim 50 which is a segmented polyurethane.
54. (Original) The polymer of claim 50 which is a biomaterial.
55. (Currently Amended) The polymer of claim 54 which is [[substantially]] free of ether, ester, and carbonate linkages.
56. (Original) The polymer of claim 50 which is linear, branched, or crosslinked.
57. (Previously presented) A segmented polymer comprising a soft segment prepared from a compound of the formula:



wherein:

each Y is independently OH or NR⁴H;

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

q = 1-100,000;

R¹, R², and R⁵ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

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Z is $-C(R^3)_2-$ wherein each R^3 is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms, wherein the two R^3 groups within $-C(R^3)_2-$ can be optionally joined to form a ring; each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, optionally including heteroatoms;

each R^4 is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, and

V is $[-O-Si(R)_2-$ or] R^1 ;

with the proviso that the polymer is [[substantially]] free of carbonate linkages.

58. (Original) The polymer of claim 57 wherein $p = 1-100$.
59. (Original) The polymer of claim 58 wherein $p = 2-12$.
60. (Original) The polymer of claim 57 wherein the number average molecular weight of the compound of the formula $Y-[-(R^1)_n-(-Z-(R^2)_m-)_p-(-Si(R)_2-V_r-)_q-]_q-R^5-Y$ is no greater than about 100,000 grams/mole.
61. (Original) The polymer of claim 57 wherein R^1 and R^2 are each independently a straight chain alkylene group, an arylene group, or combinations thereof.
62. (Original) The polymer of claim 61 wherein R^1 and R^2 are each independently groups containing up to 100 carbon atoms.
63. (Original) The polymer of claim 62 wherein R^1 and R^2 are each independently groups containing up to 20 carbon atoms.

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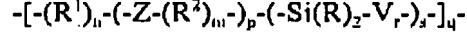
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64. (Original) The polymer of claim 63 wherein R¹ and R² are each independently groups containing 2 to 20 carbon atoms.
65. (Original) The polymer of claim 57 wherein each R² includes at least two carbon atoms.
66. (Currently Amended) The polymer of claim 57 wherein each R³ is independently a straight chain alkyl group, an aryl group, or combinations thereof, ~~optionally including heteroatoms~~.
67. (Original) The polymer of claim 66 wherein each R³ is independently a straight chain alkyl group containing 1 to 20 carbon atoms.
68. (Original) The polymer of claim 57 wherein each Y is OH.
69. (Original) The polymer of claim 57 wherein each R⁴ is independently H or a straight chain alkyl group.
70. (Original) The polymer of claim 57 which is linear, branched, or crosslinked.
- 71-75. (Cancelled)
76. (Currently Amended) A method of making a segmented polymer comprising a soft segment comprising a group of the formula



the method comprising combining an organic compound containing two or more groups capable of reacting with hydroxyl or amine groups with a polymeric starting compound of the formula:

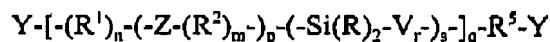
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wherein:

each Y is independently OH or NR⁴H;

n = 0 or 1;

m = 0 or 1;

p = 1-100,000;

r = 0-100,000;

s = 1-100,000;

q = 1-100,000;

R¹, R², and R⁵ are each independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, ~~optionally including heteroatoms~~;Z is -C(R³)₂- wherein each R³ is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, ~~optionally including heteroatoms~~, wherein the two R³ groups within -C(R³)₂- can be optionally joined to form a ring;each R is independently a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof, ~~optionally including heteroatoms~~;each R⁴ is independently H or a saturated or unsaturated aliphatic group, an aromatic group, or combinations thereof; andV is [[-O-Si(R)₂- or]] R¹;

with the proviso that the polymer is [[substantially]] free of carbonate linkages.

77. (Currently Amended) The method of claim 76 wherein the polymeric starting compound is prepared by a method comprising:

combining monomers of Formula II [[or]] and Formula III;

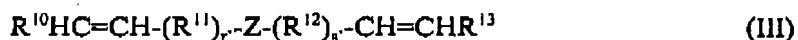
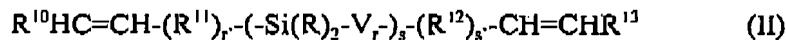
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wherein:

r, s, V, Z, and R are as defined [[above]] in claim 76;

r' = 0 or 1;

s' = 0 or 1;

R¹⁰ and R¹³ are each independently hydrogen or straight chain, branched, or cyclic alkyl groups containing up to 6 carbon atoms; and

R¹¹ and R¹² are each independently a saturated aliphatic group, an aromatic group, or combinations thereof;

with an alkene metathesis catalyst, and optionally applying a vacuum

further wherein the method includes combining the monomers with a chain transfer agent before adding the alkene metathesis catalyst, or the method includes allowing the monomers to polymerize in the presence of the alkene metathesis catalyst prior to adding a chain transfer agent.